

# **Sensing Platforms.....**

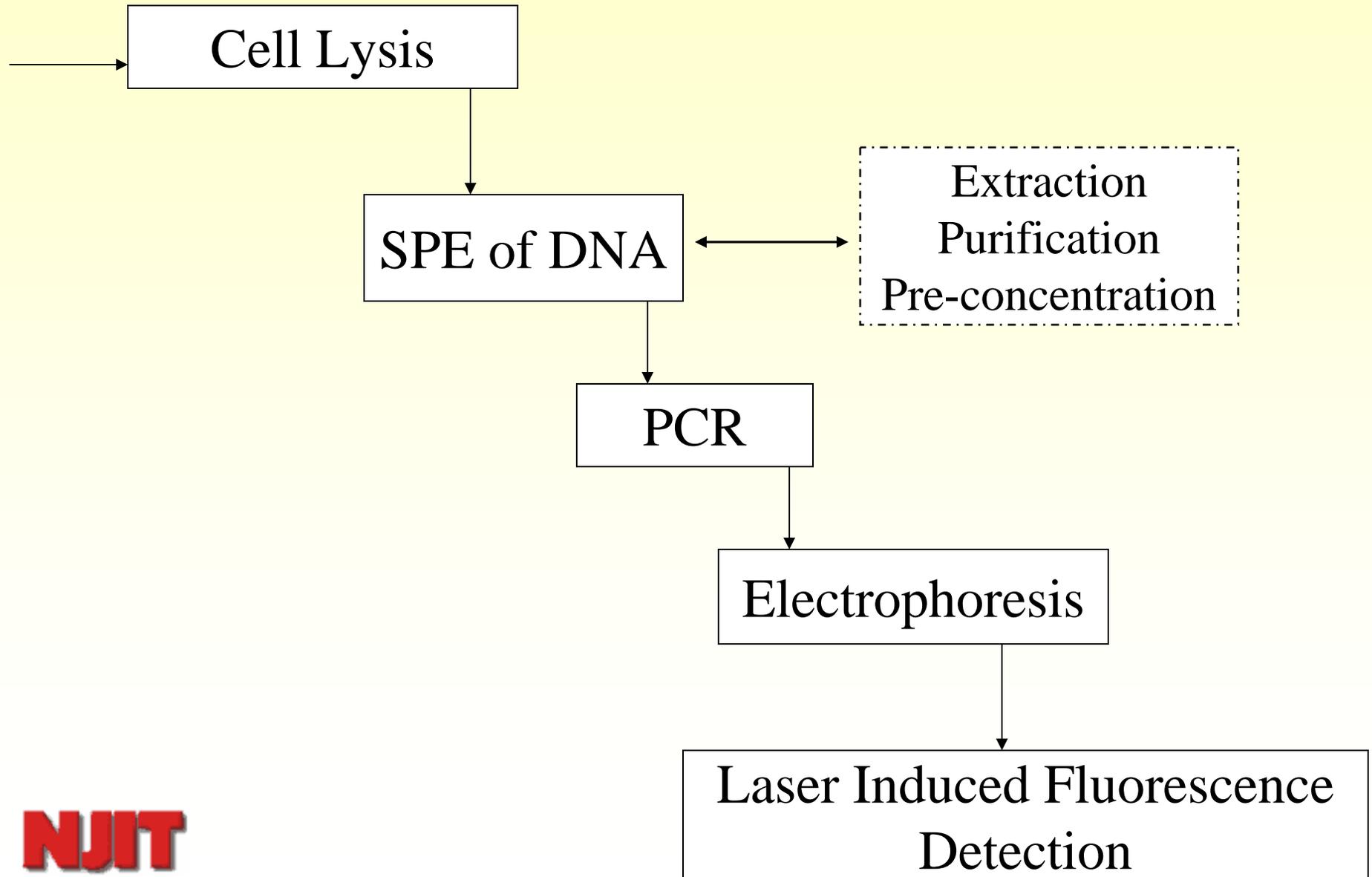
**C. Saridara, M. Karwa, R. Brukh, Z. Iqbal, S.  
Mitra**

**Department of Chemistry and Environmental  
Science**

**New Jersey Institute of Technology, Newark,  
NJ, USA.**

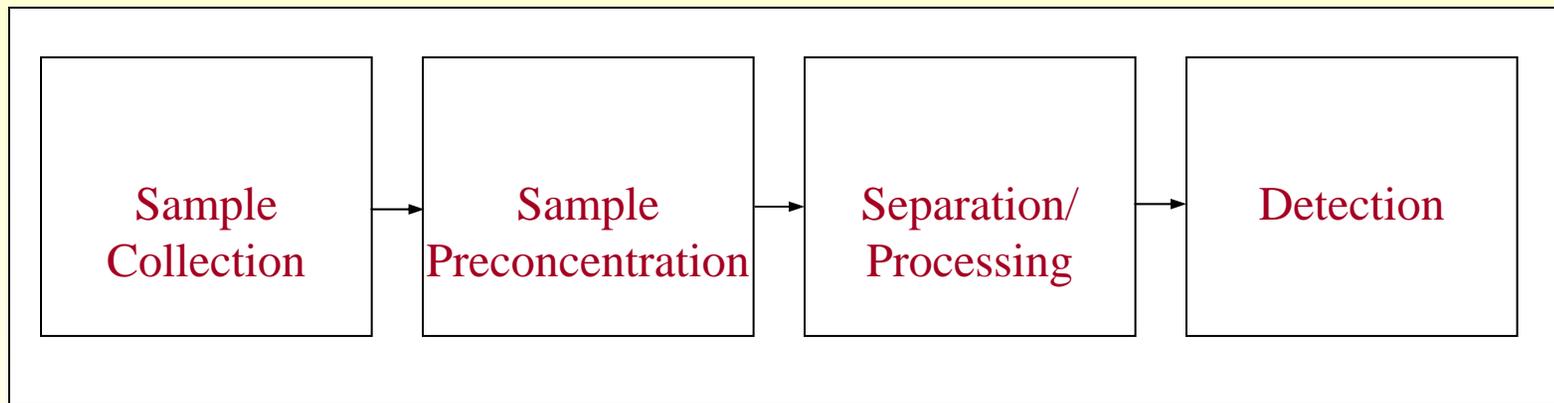
**NJIT**

# Schematic of the Processes

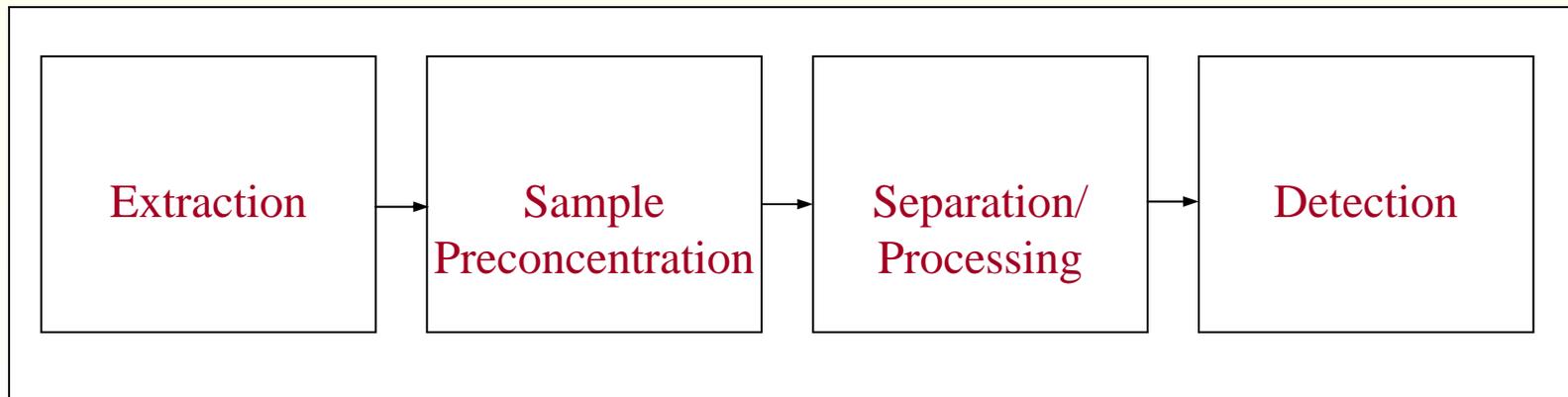


# Typical Approach to Trace Monitoring

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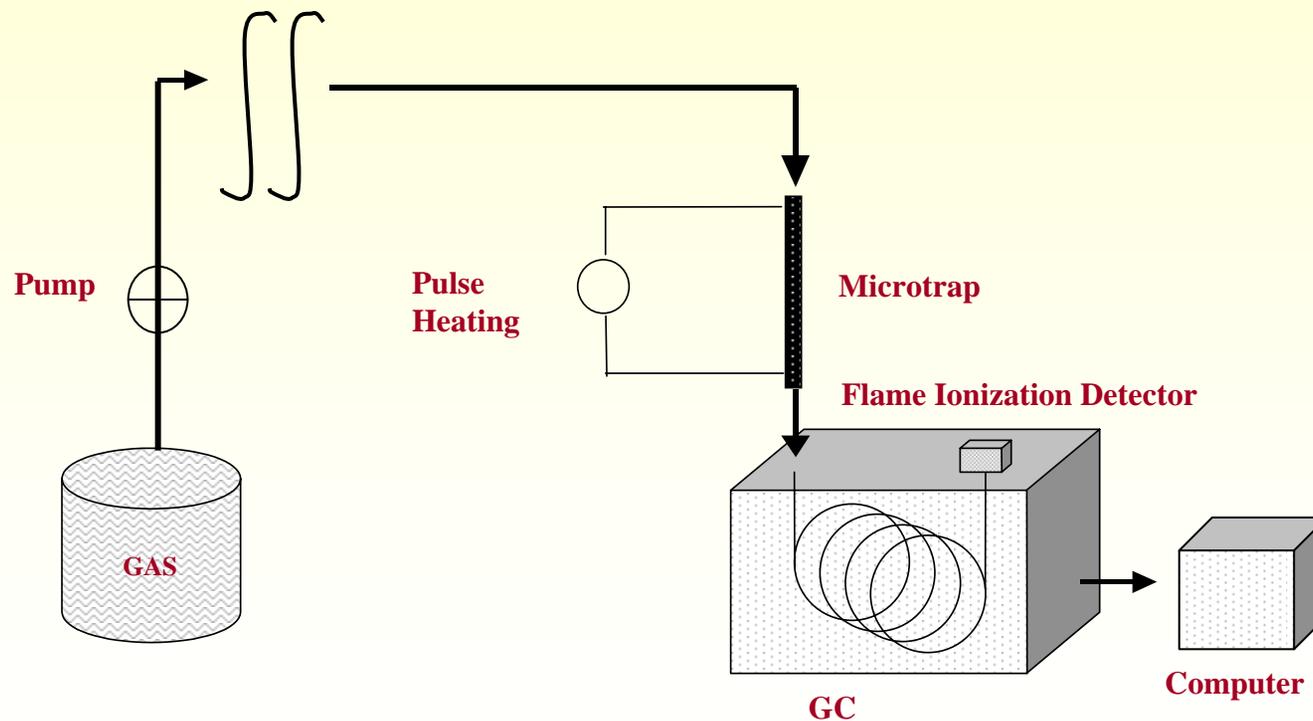


**Air**

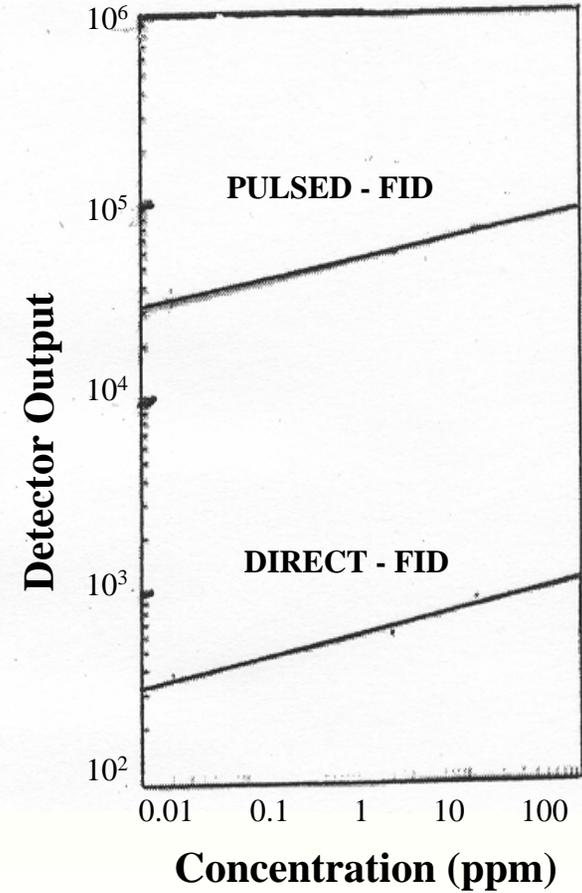
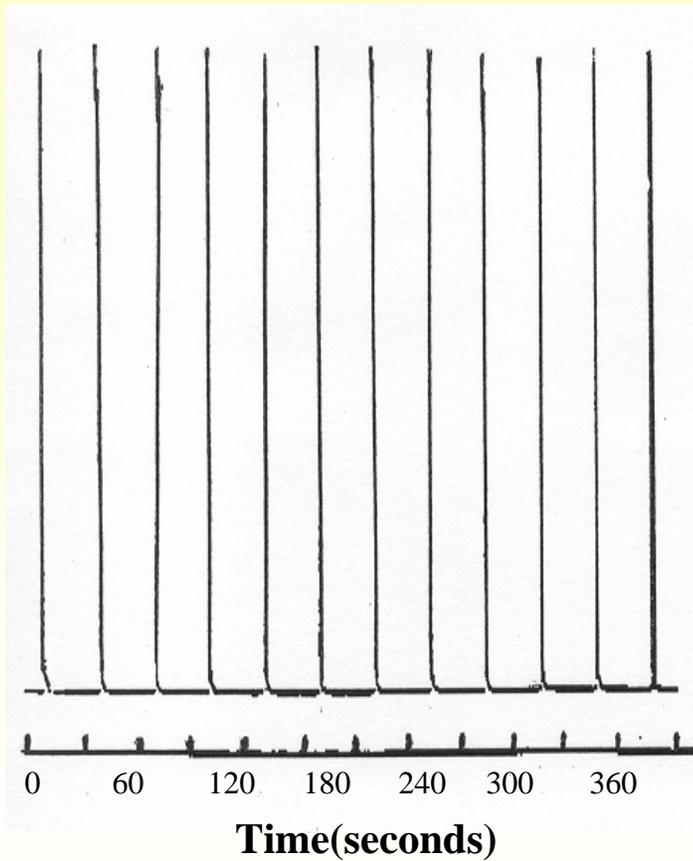


**Water**

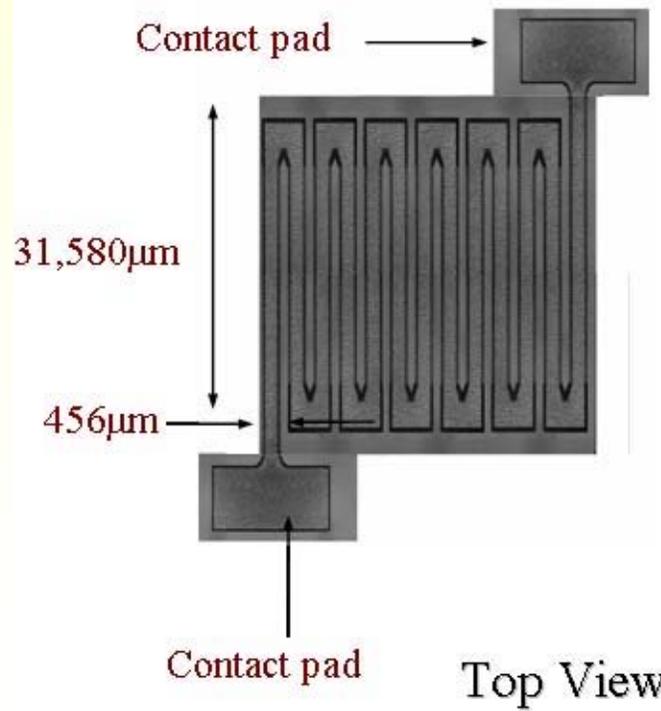
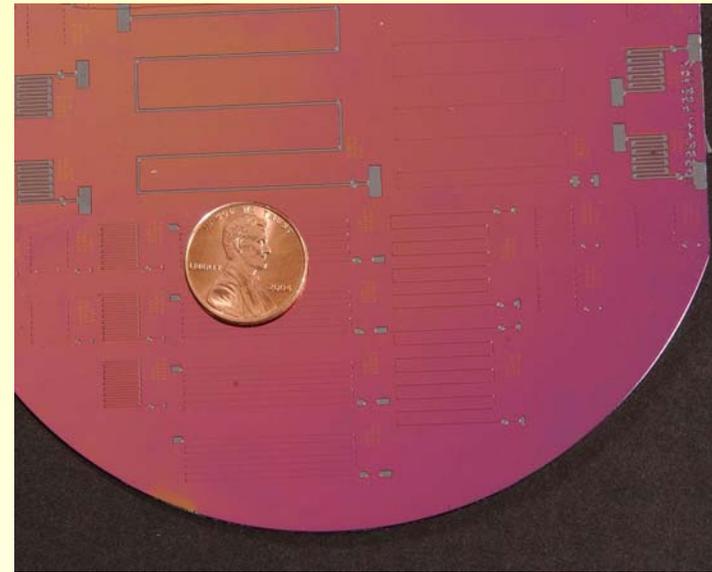
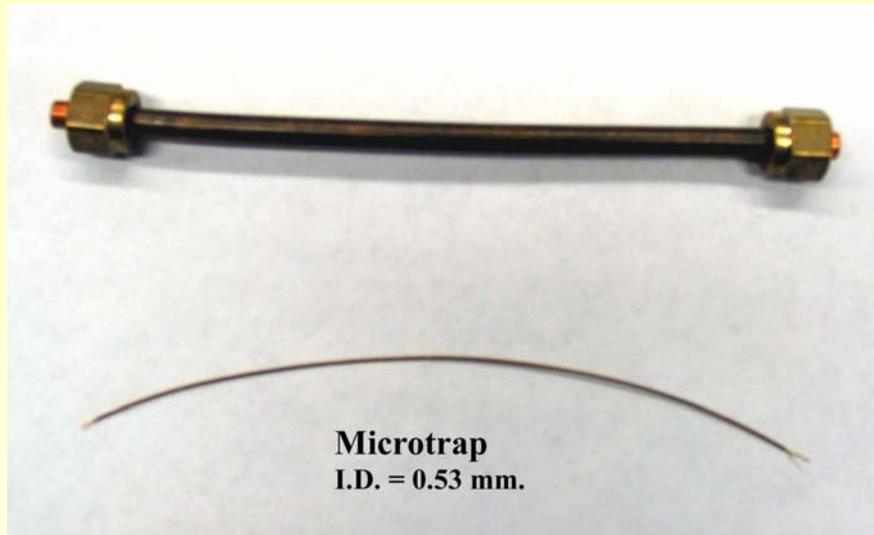
# Microtrap for Online Concentration and Injection



# Response of the Microtrap Pulsed FID



J. Chrom. A. 1072 (2005) 243

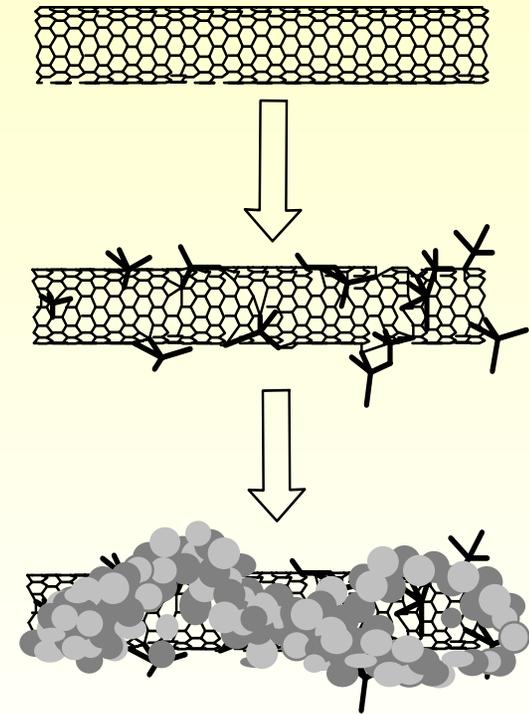
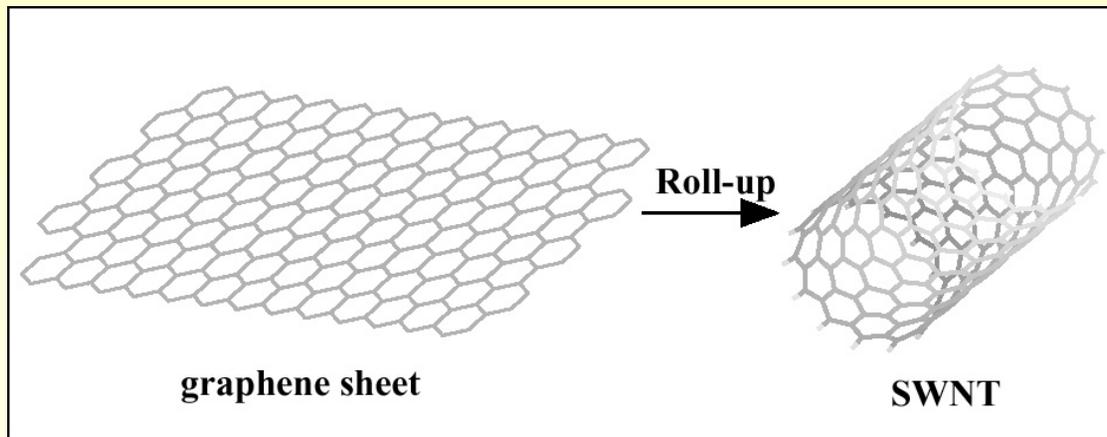


M. Kim and S. Mitra J. Chrom. A. 2000

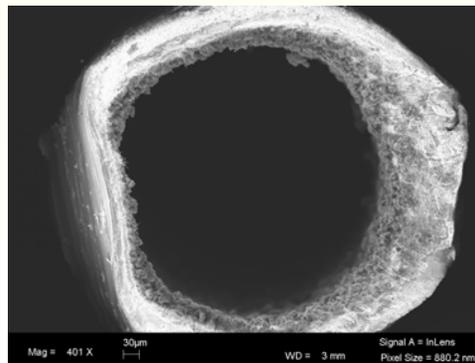
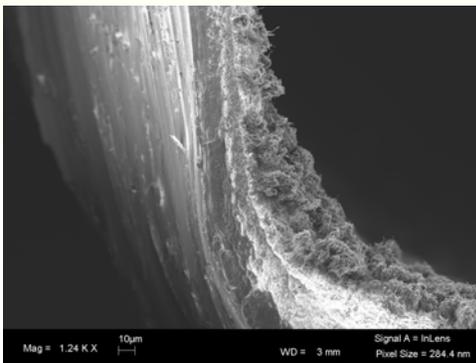
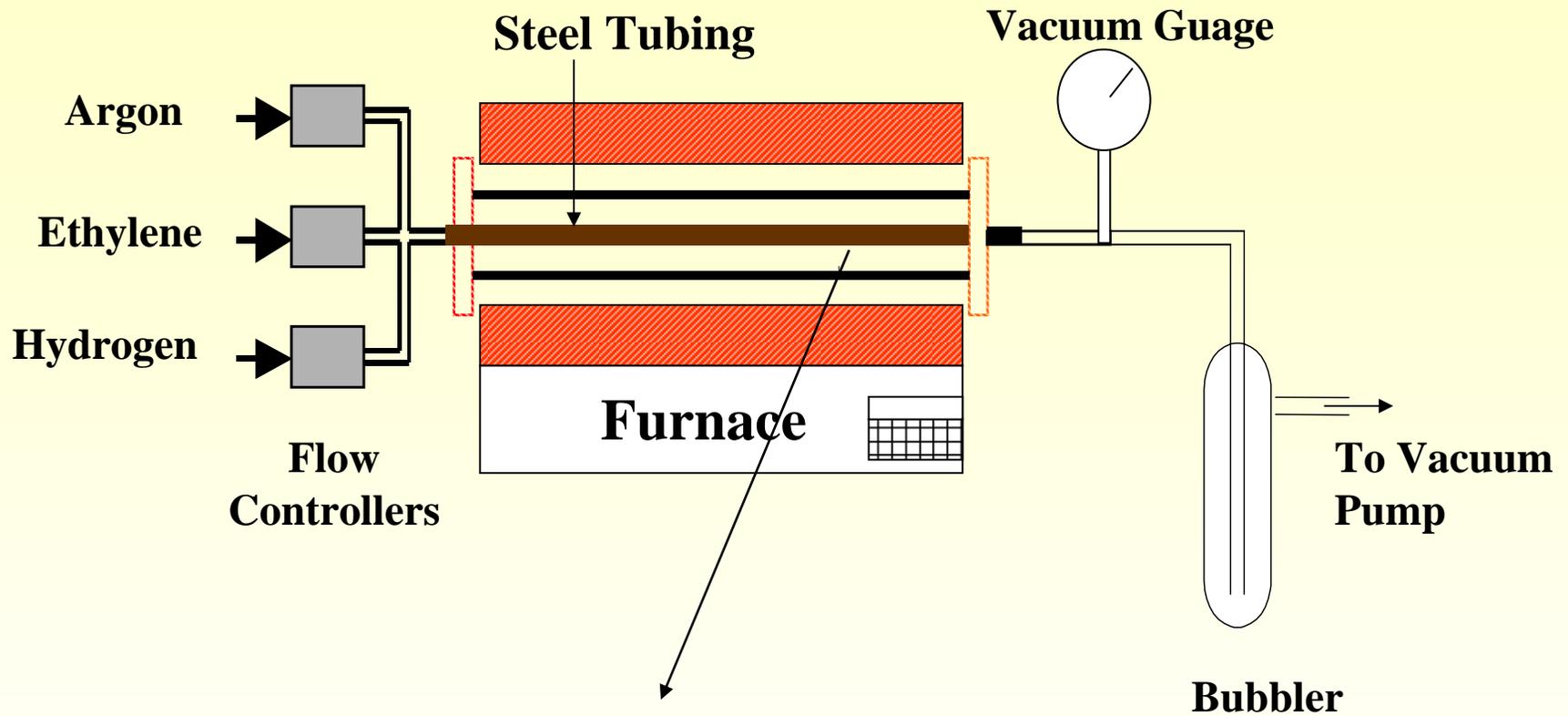
**Scaled Up Self-assembly  
of**

**Carbon Nanotubes**

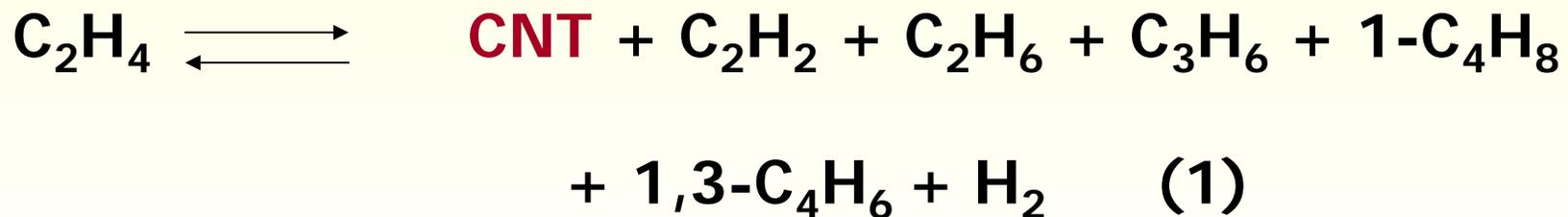
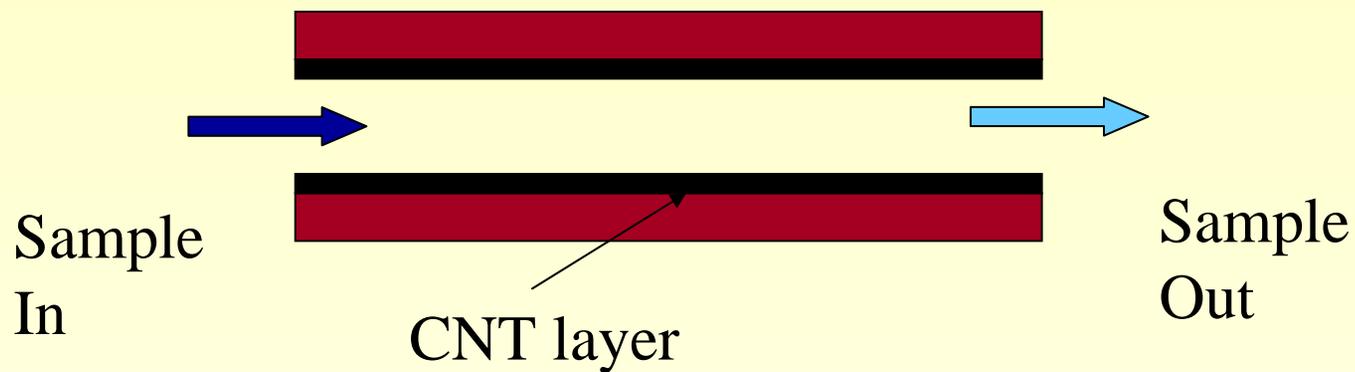
# Carbon Nanotubes



- Laser Ablation
- Catalytic Arc
- Catalytic CVD



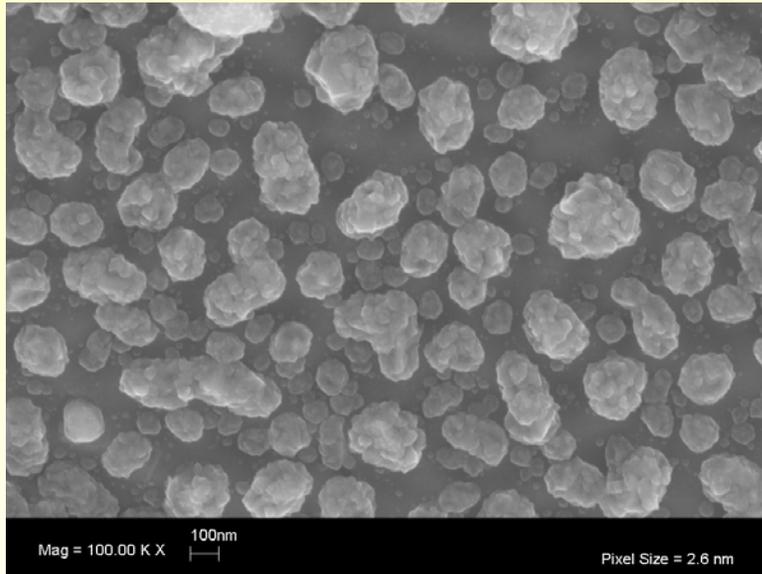
- Catalytic Arc
- Catalytic Laser Ablation
- Catalytic CVD



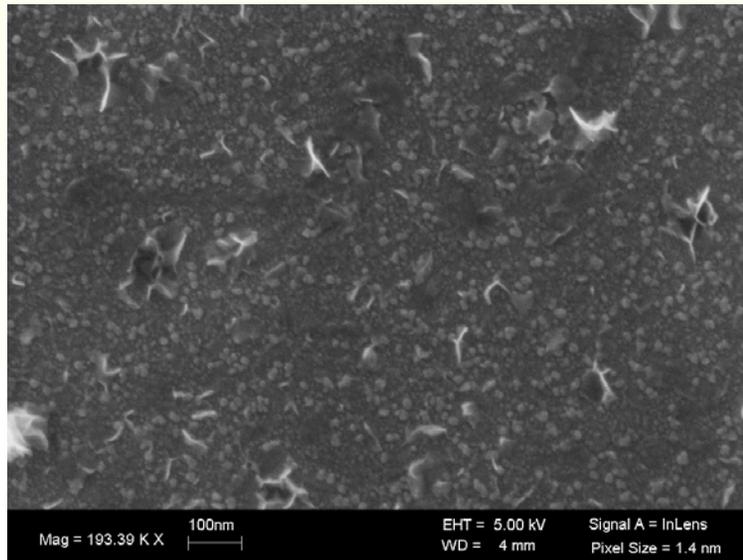
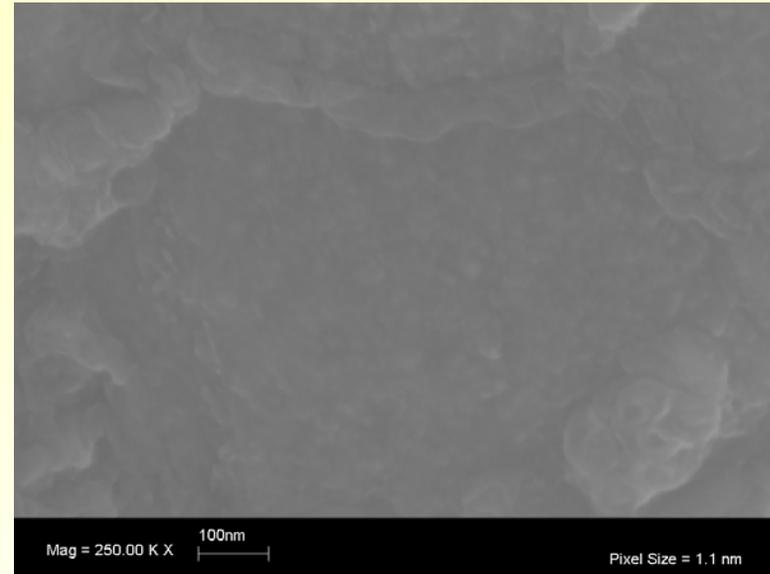
(1) Ref. : Can. J. Chem./Rev. Can. Chim. 78(1): 16-25 (2000)

(2) Ref. : Jacobson, B.I, Smalley, R.E, Am. Sci., 85, 324 (1997)

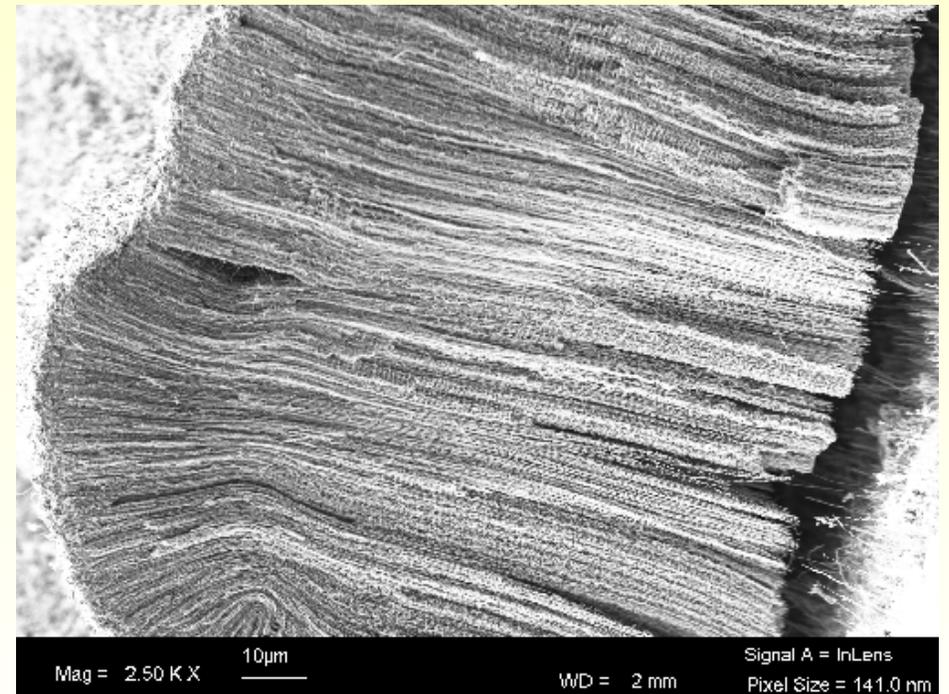
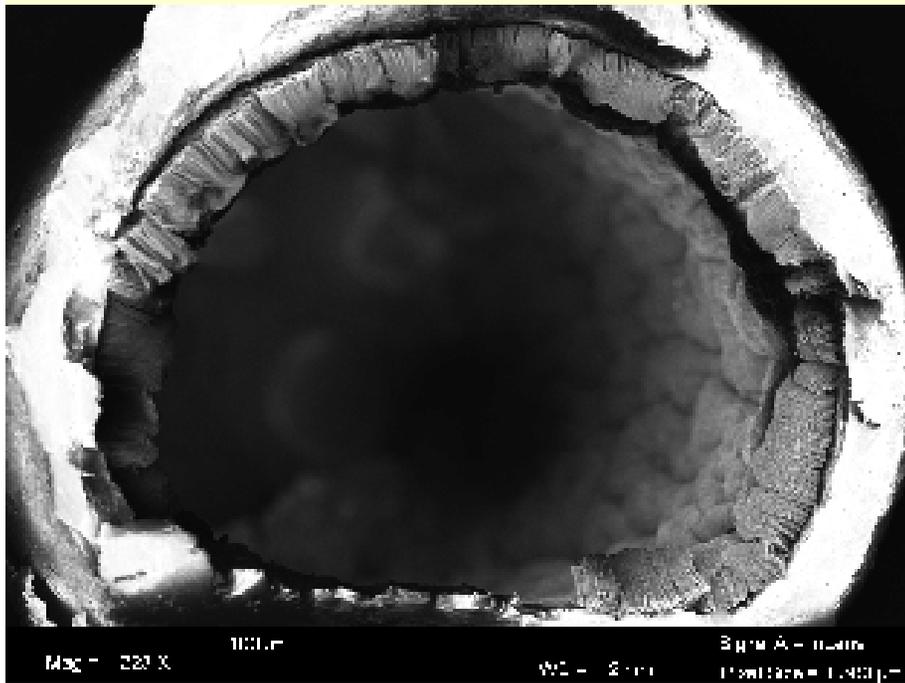
## 500 C Treatment

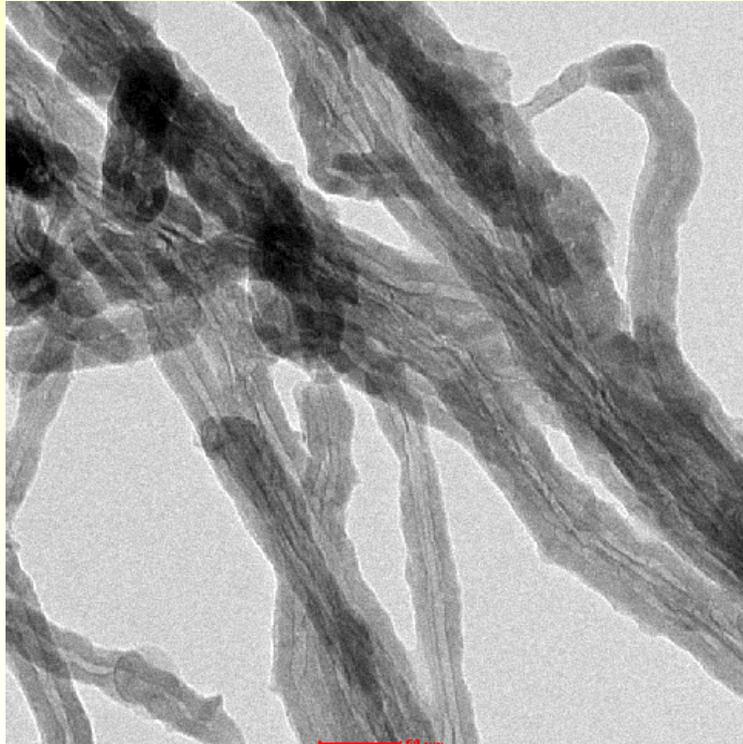


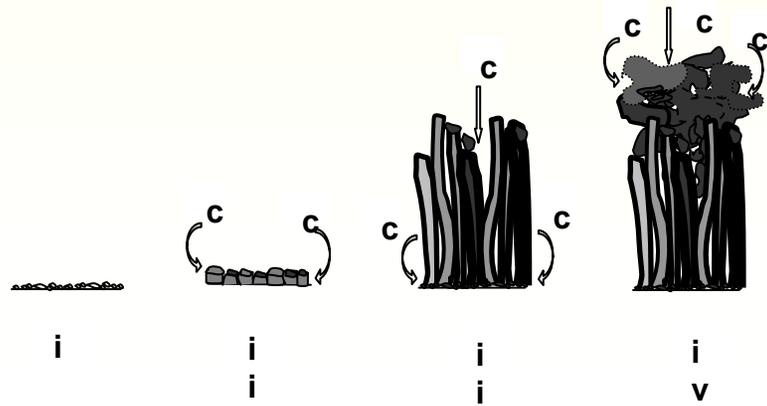
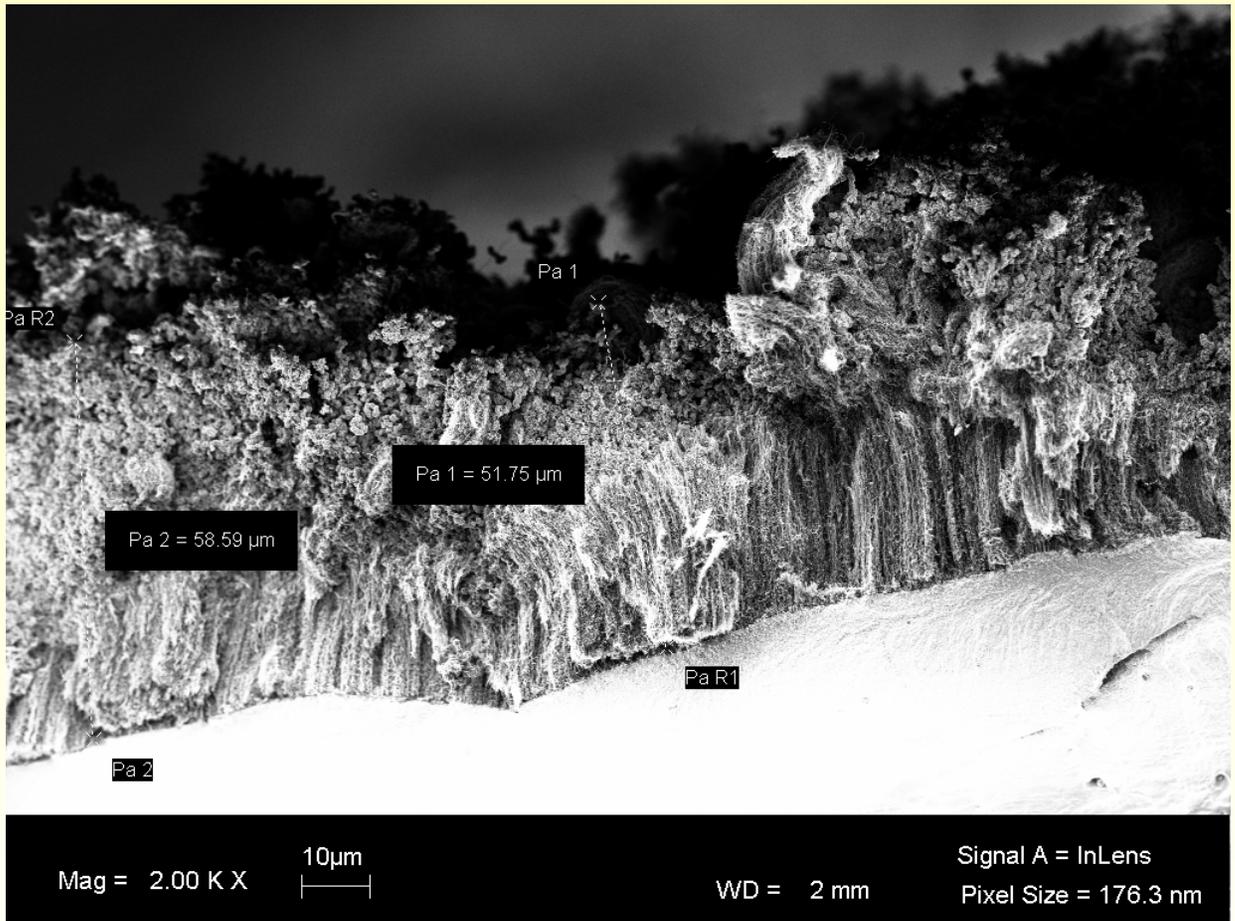
## 700 C Treatment

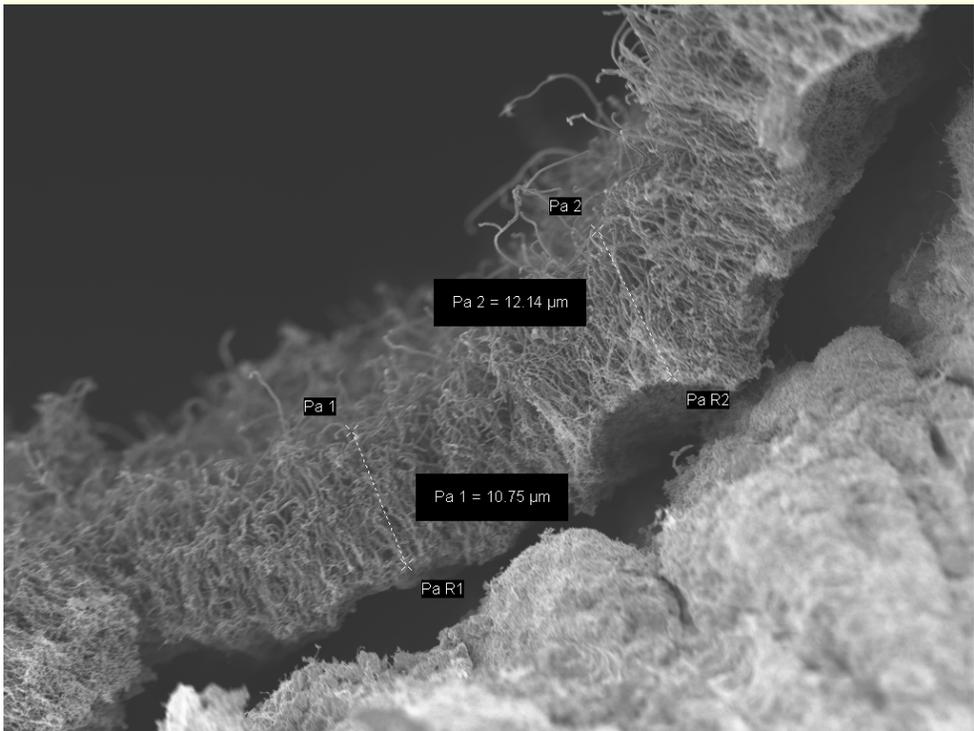
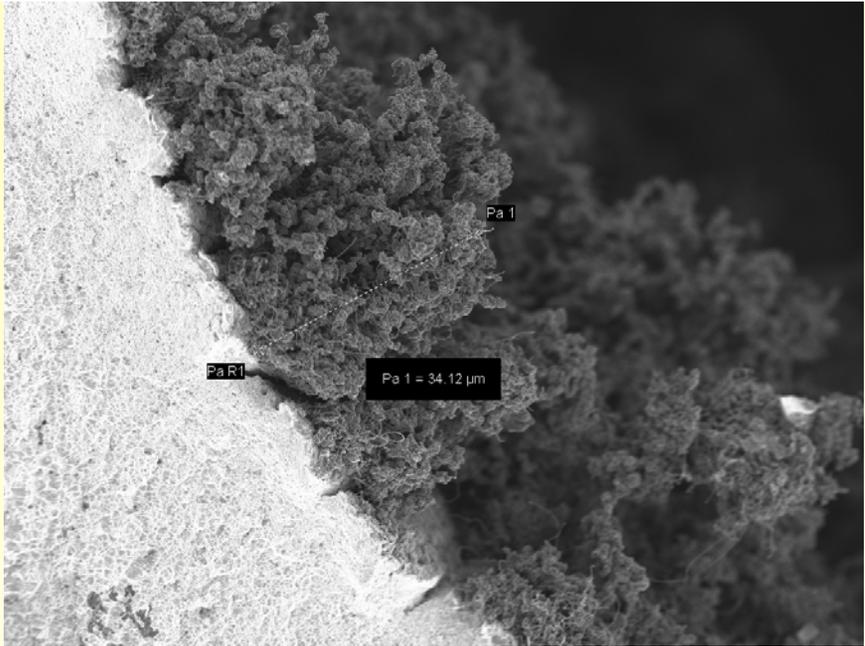
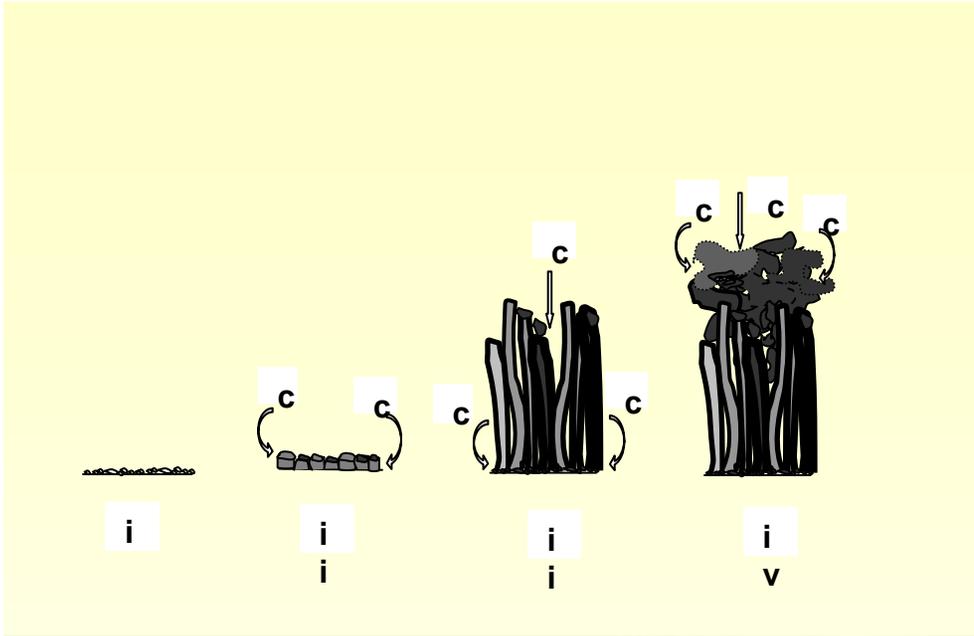


## Electrodeposited Cobalt

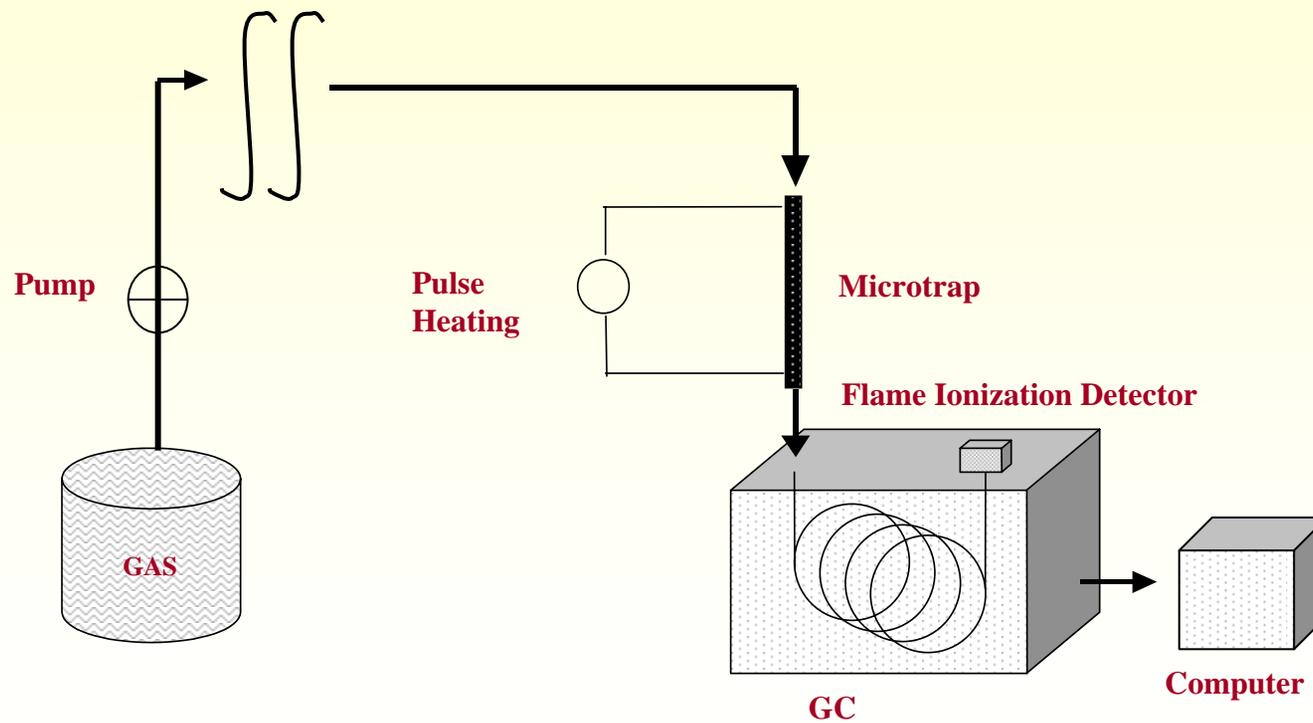


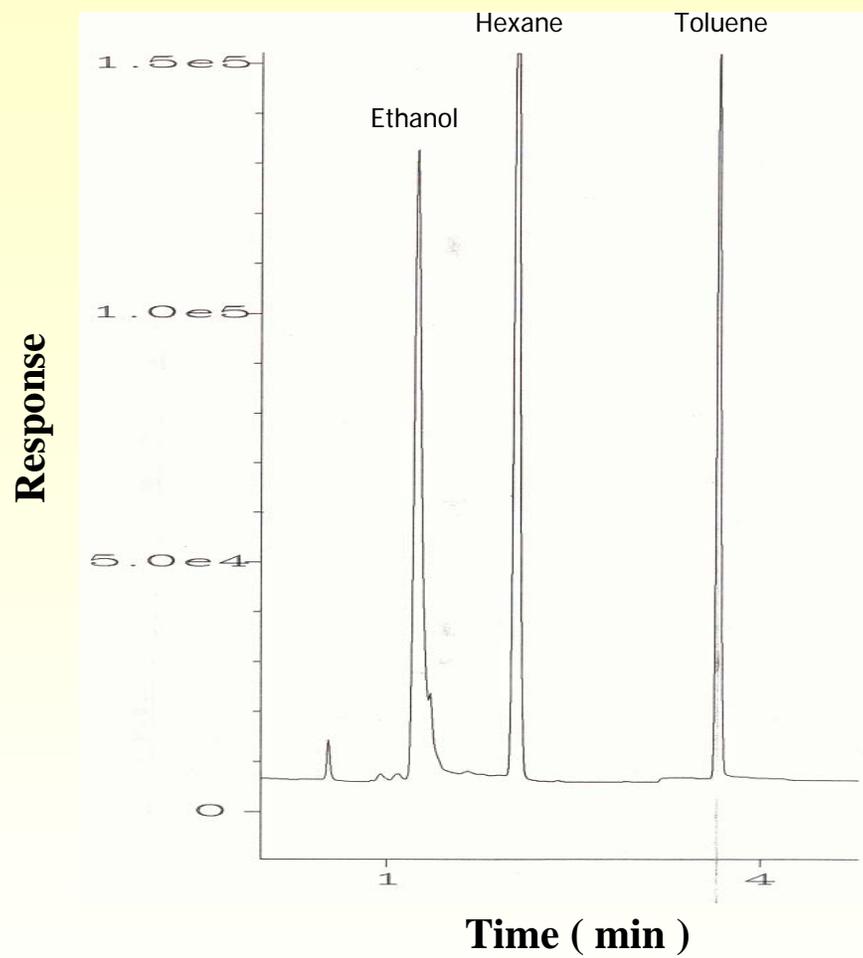
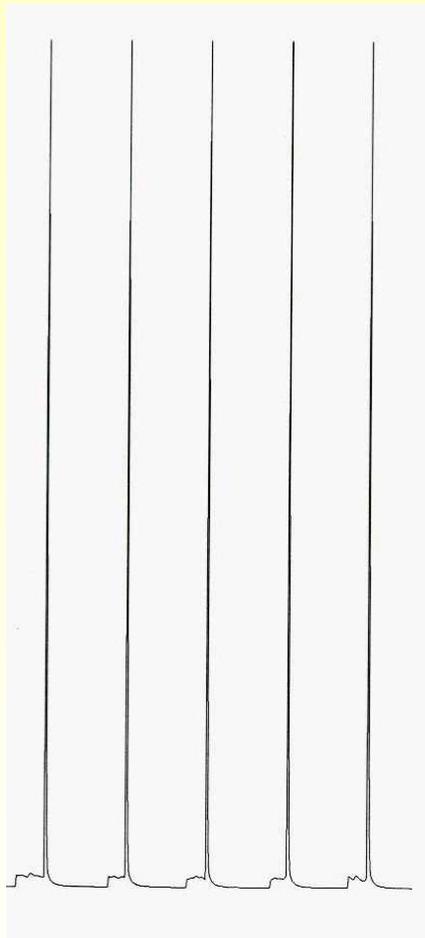






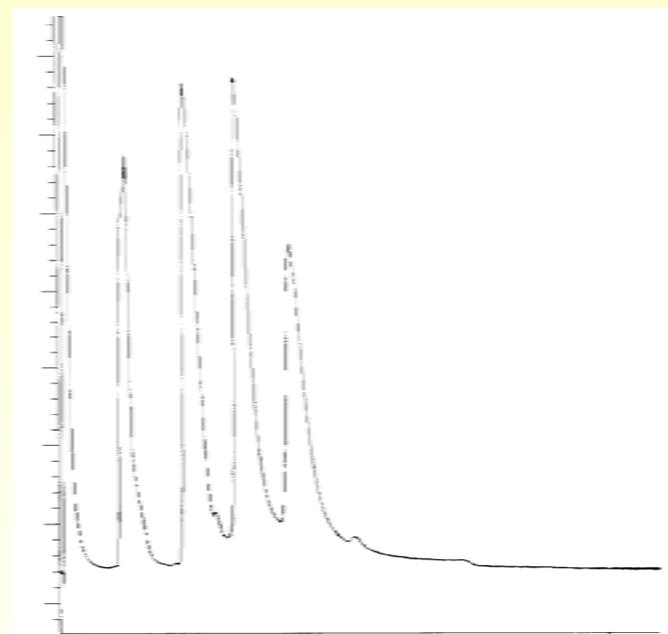
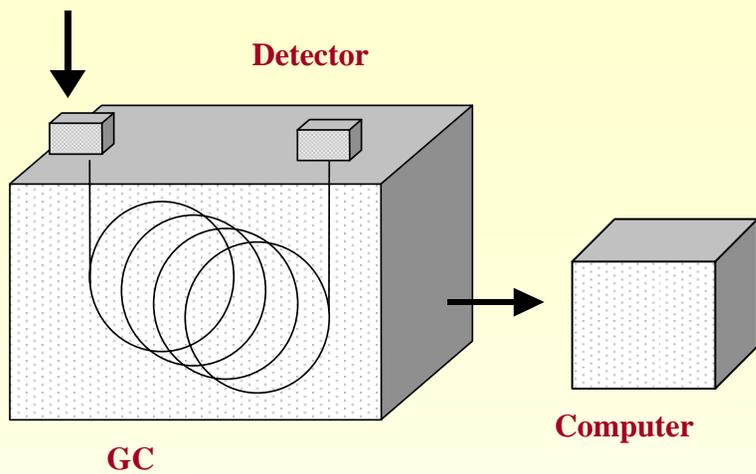
# CNT-Microtrap



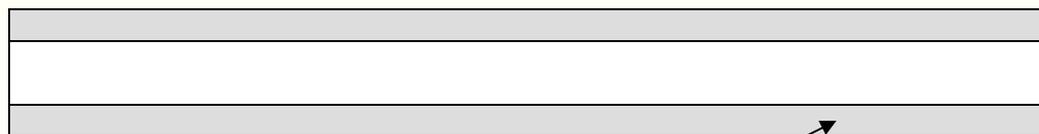


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Anal. Chem. 2005

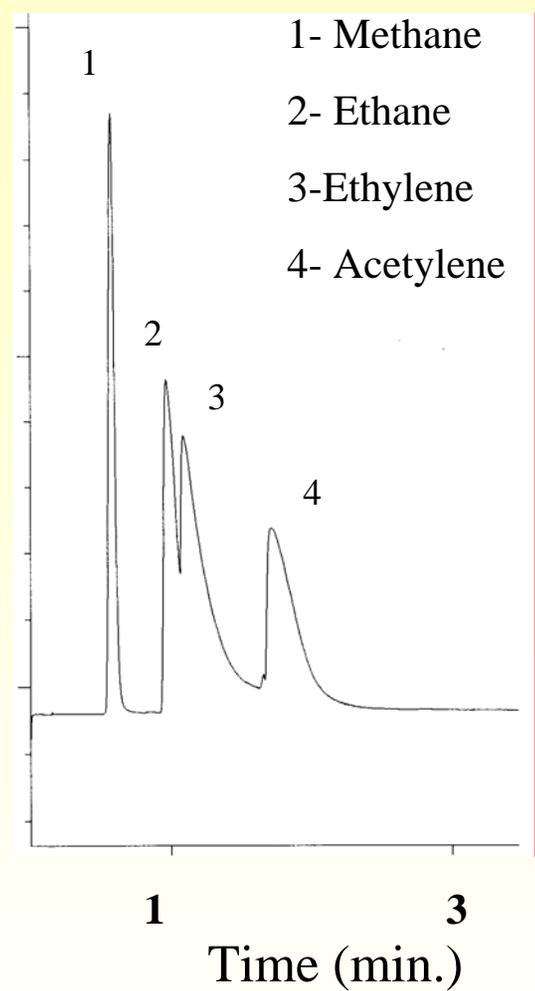
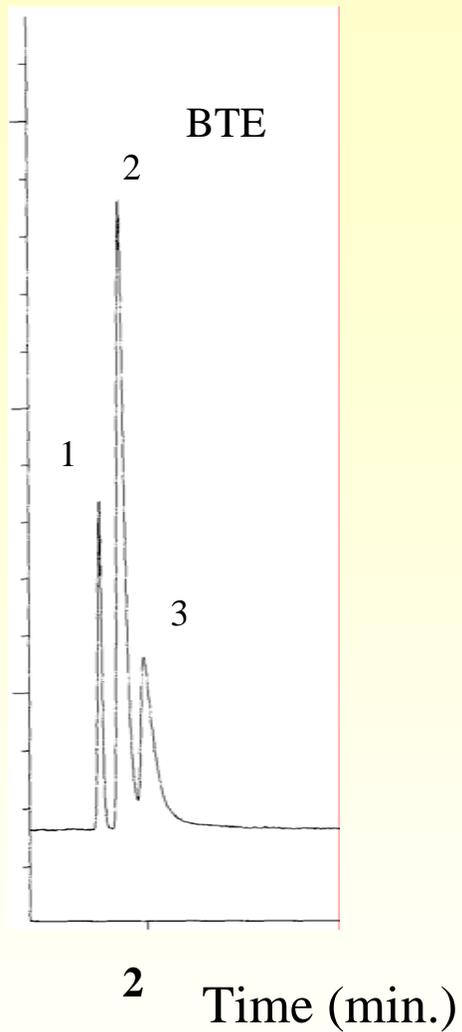
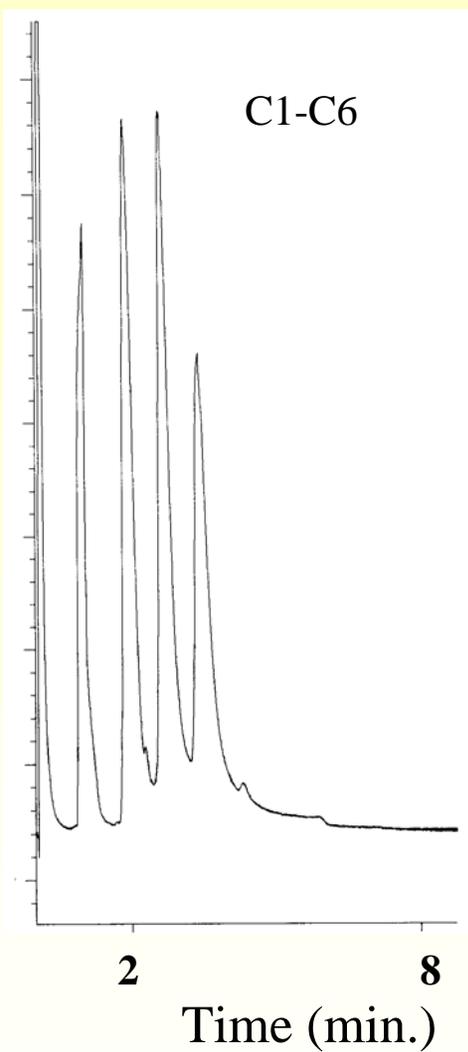
# Gas Chromatography



## Columns

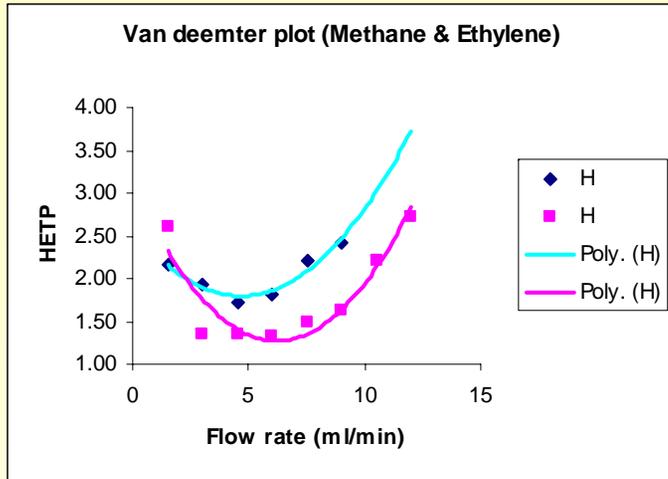


CNT

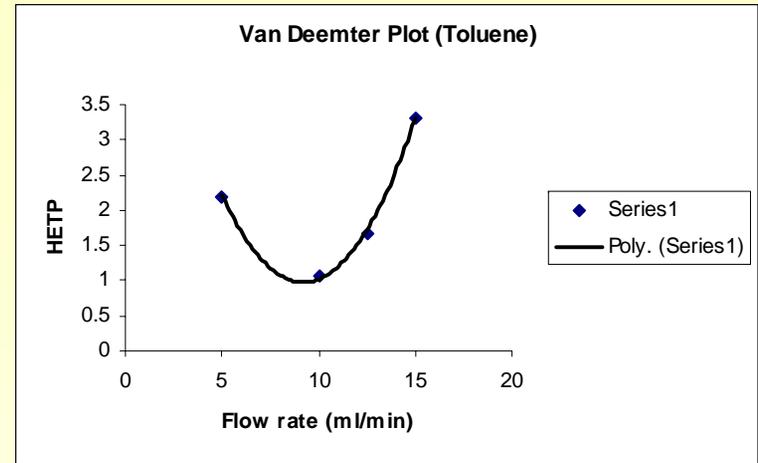


1500-2000 plates/m

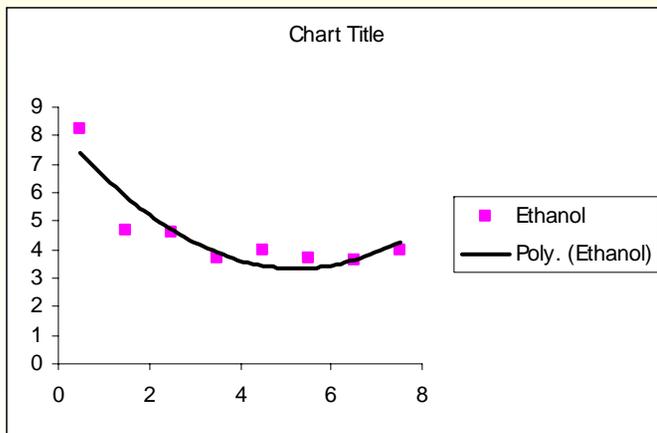
C. Saridara and S. Mitra, *Anal. Chem.* 2005



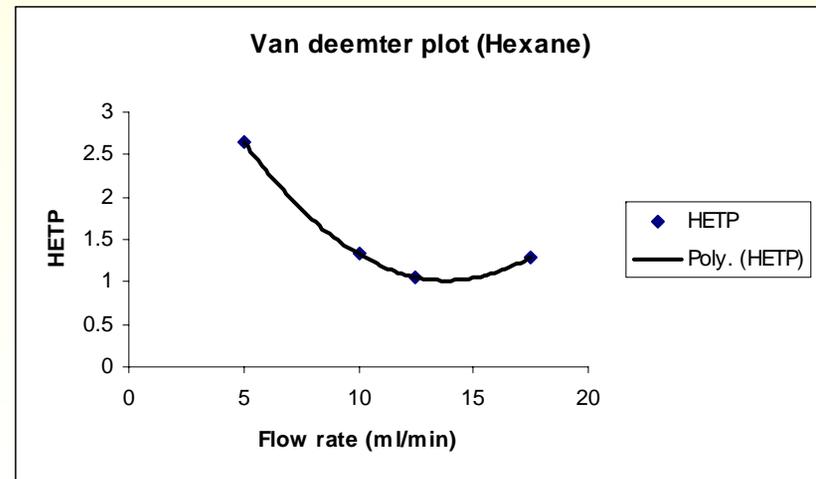
Methane and ethylene in  $C_2H_4$ -CVD



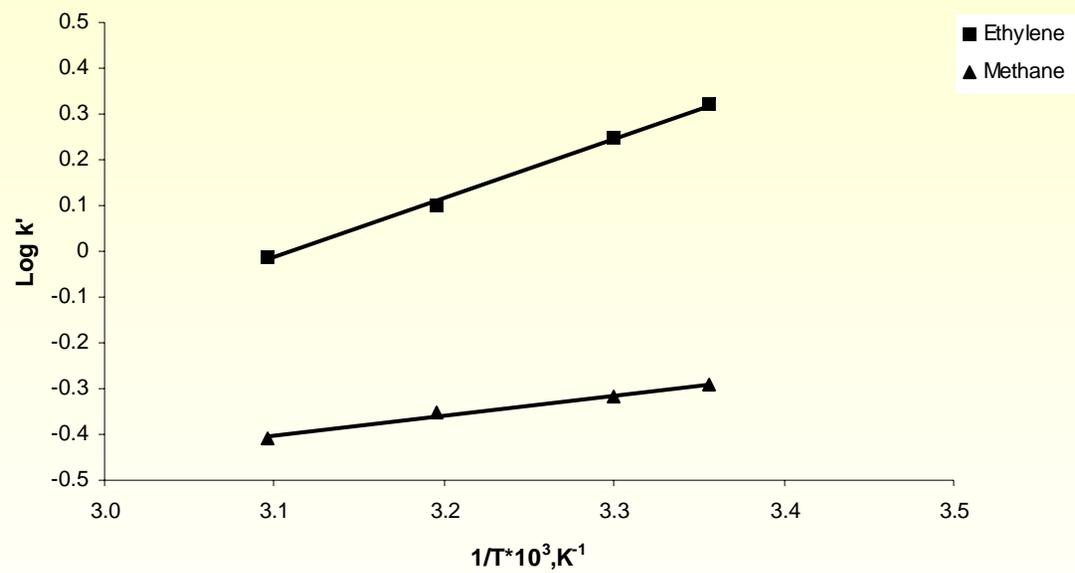
Toluene in  $C_2H_4$ -CVD



Ethanol in CO-CVD



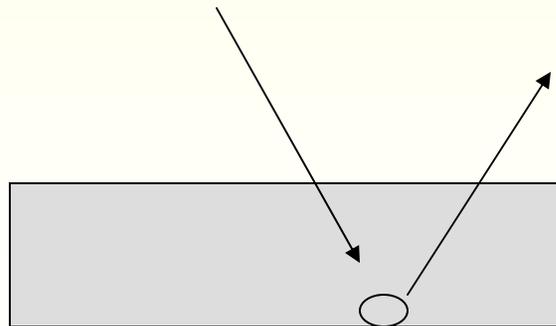
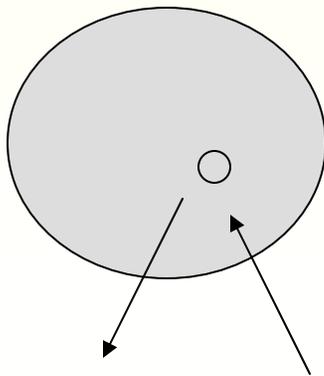
Hexane in  $C_2H_4$ -CVD



# Potential Advantages

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- **CNTS offer:**
  1. **High capacity in the open tubular format**
  2. **Thermal stability at high temp.**
- **Fast desorption**
- **Fabrication by self-assembly**
- **Nanotubes fine-tuned to specifications.**



**NJIT**